BC Biomedical
A Unit of BC Group International, Inc.

ELECTRO-SURGERY UNIT ANALYZER

ESU-2000A

USER MANUAL

BC BIOMEDICAL
ESU-2000A
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WARNING

All connections to patients must be removed before connecting the Device Under Test (DUT) to the Analyzer. A serious hazard may occur if the patient is connected when testing with the Simulator. Do not connect any leads from the patient directly to the Analyzer or DUT.

CAUTION

Always turn the ESU under test off before making or removing connections. Never touch exposed metal surfaces on test leads or other current carrying parts while ESU is activated. Never open the ESU-2000A when connected to an ESU. Electro-Surgery units generate high frequency/RF voltages at high levels.

N O T I C E

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Rev 02

BC GROUP
ESU-2000A
ELECTRO-SURGERY UNIT ANALYZER

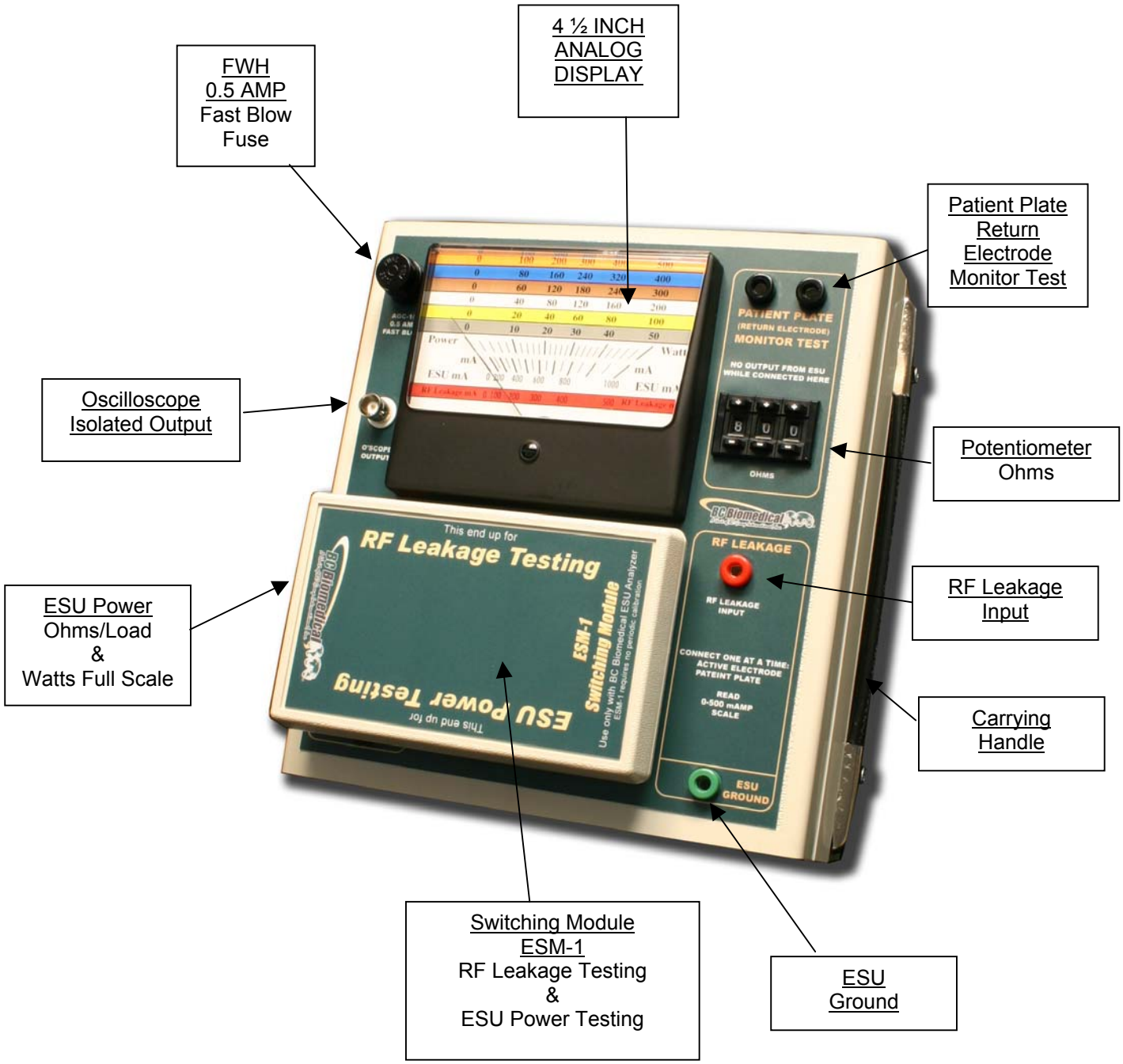
The Model ESU-2000A is a precision Electro-Surgery Unit Analyzer (ESU). It tests the RF power output of Electro-Surgery Units. The power reading is taken from a large 4 ½ inch analog display. It offers six resistive loads for RF power testing from 50 to 500 ohms, along with a 200 ohm load for RF leakage current testing. The patient return electrode resistance simulation is adjustable in one ohm increments from 0 to 999 ohms.

The following are highlights of some of the main features:

- LARGE 4 ½ INCH ANALOG DISPLAY
- +/- 5% OF FULL SCALE ACCURACY
- RETURN CONTACT MONITOR TEST
- RF LEAKAGE TEST
- PORTABLE
- OSCILLOSCOPE ISOLATED OUTPUT
- 0-10 MHz BANDWIDTH
- EASY OPERATION
- ACCESSORY KIT INCLUDED
- HIGH IMPLACT PLASTIC ENCLOSURE

OVERVIEW

This section looks at the layout of the ESU-2000A and gives descriptions of the elements that are present.



SAFETY PRECAUTIONS

CAUTION

Electro-Surgery Units (ESUs) produce high frequency/RF output voltages up to 500 volts.

CAUTION

Always turn the ESU under test Off before making or removing connections.

CAUTION

Never touch exposed metal surfaces on test leads or other current-carrying parts while the ESU is activated.

CAUTION

Refer to ESU manufacturer's manuals and specifications for safety and testing information.

CAUTION

Only replace the ESU-2000A fuse with the specified rating and type.

CAUTION

Never open the ESU-2000A case when it is connected to an ESU.

OPERATING INSTRUCTIONS

ESU RF Power Measurements

1. Consult the ESU manufacturer's manual for load specifications.

2. Turn off ESU under test. Remove all connections between the ESU under test and the ESU-2000A.

3. Install the BC Biomedical Switching Module on the ESU-2000A front panel so that the words "ESU Power Testing" are right-side-up. When installed correctly, the Active Electrode connectors should be exposed, and the RF Leakage connectors should be inaccessible.

4. Connect the ESU's Patient Plate to the ESU-2000A's black Patient Plate connector using a black test lead.

5. Connect the ESU's Active Electrode to the ESU-2000A's desired load range connector in the Active Electrode area, on the left side of the front panel. The Active Electrode input connectors are color coded, and each corresponds to a color-coded range on the analog meter. The full-scale watts range for each range equals the input resistance. For example, the 50 ohms input resistance range has a full-scale watts range of 50 watts, etc.

6. Turn the controls on the ESU under test to minimum power, and then activate the CUT or COAG modes. Turn the ESU power to the desired levels, being careful to not exceed the full-scale wattage range selected on the ESU-2000A. Note the reading on the ESU-2000A on the proper color-coded wattage range, and record it if desired. If the milliamp output, rather than watts, is required, that reading may be obtained by reading the lower 0-1000 milliamp scale.

7. Turn the ESU power to minimum and deactivate the output before disconnecting from ESU-2000A, or before moving the Active Electrode test lead to a different input range connector.

ESU RF Leakage Current Measurements

1. Turn off ESU under test. Remove all connections between the ESU under test and the ESU-2000A.

2. Install the BC Biomedical Switching Module on the ESU-2000A front panel so that the words “RF Leakage Testing” are right side up. When installed correctly, the Active Electrode connectors should be inaccessible, and the RF Leakage connectors should be exposed.

3. Connect the ESU’s Active Electrode to the ESU-2000A’s red RF Leakage connector using a red test lead. **DO NOT MEASURE ACTIVE ELECTRODE LEAKAGE ON NON-ISOLATED ESUs with the ESU-2000A. Damage may occur to the ESU-2000A.**

4. Connect the ESU’s case ground to the ESU-2000A’s green ESU Ground connector using a green test lead.

5. Turn the controls on the ESU under test to minimum power, then activate the CUT or COAG modes. Turn the ESU power to the desired level. Note the Active Electrode RF Leakage current reading on the ESU-2000A’s red 0-500 milliamps RF Leakage scale, and record it if desired.

6. Turn the ESU power to minimum and deactivate the output.

7. Move the red test lead to the Patient Plate connection on the ESU under test. Leave the ground connection in place.

8. Turn the controls on the ESU under test to minimum power, then activate the CUT or COAG modes. Turn the ESU power to the desired level. Note the Patient Plate RF leakage current reading on the ESU-2000A’s red 0-500 milliamps RF Leakage scale, and record it if desired.

9. Turn the ESU power to minimum and deactivate the output. Disconnect all test leads.

Patient Plate Return Electrode Monitor Test

1. Turn off ESU under test. Remove all connections between the ESU under test and the ESU-2000A.

2. Use an actual return electrode monitor patient plate connected to the ESU under test. Cut off the plate and expose the two wires.

3. Connect both wires to the two ESU-2000A Patient Plate Return Electrode Monitor Test jacks in the upper right corner via test leads of any color with alligator clips.

4. Apply power to the ESU under test, and verify operation of its return electrode monitor mode, as specified by the ESU manufacturer, using various “Ohms” settings on the ESU-2000A.

5. Turn off power to the ESU under test, and remove all connections.

MANUAL REVISIONS

Revision #	Engineering #	Revisions Made
Rev 01	DT7375	New Manual Format
Rev 02	DT7375	Accessory Fuse Updated

LIMITED WARRANTY

WARRANTY: BC GROUP INTERNATIONAL, INC. WARRANTS ITS NEW PRODUCTS TO BE FREE FROM DEFECTS IN MATERIALS AND WORKMANSHIP UNDER THE SERVICE FOR WHICH THEY ARE INTENDED. THIS WARRANTY IS EFFECTIVE FOR TWELVE MONTHS FROM THE DATE OF SHIPMENT.

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SPECIFICATIONS

ESU-2000A

Display	4-1/2” analog meter Meter accuracy is +/- 2.0 % of full scale Color-coded scales in Watts and Milliamps
Selectable Loads & Ranges	50, 100, 200, 300, 400, & 500 ohms, non-inductive Each range’s ohms load value corresponds to its full-scale watts value **(**Example: 50 ohms => 50 watts) Load accuracy is +/- 2.0 %
Watts Measurement Accuracy	+/- 5% of full scale
Frequency Response	0-10MHz
ESU Output Current Range	0-1000 mA for all ranges
RF Leakage Test	500 mA maximum into 200 ohm load, non-inductive
Return Contact Monitor Test	Digital display 0-999 ohms 1 ohm resolution
Minimum resistance at “zero” setting	3 ohms 3% accuracy
Oscilloscope Output	Isolated & uncalibrated
Fuse	FWH-1/2 0.5 amp fast blow
Case, Size, & Weight	High impact plastic enclosure 4.125” H x 8.4” W x 9.1” D 4 pounds net weight

Accessories Included

Qty.	Accessory
1	Red test lead
1	Black test lead
1	Green test lead
4	Alligator clips
2	Red clip insulators
1	Black clip insulators
1	Spare fuses
1	User manual
1	ESM-1 Switching Module

Optional Accessories Carrying Case

NOTES